Reconsidering Peers and Delinquency: How do Peers Matter?

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Abstract
This paper examines the contribution of peer relations to delinquency from the perspective of two sociological traditions: socialization/normative influence and opportunity. Earlier studies have likely overestimated normative influence by relying on respondents' reports about their friends' behaviors rather than obtaining independent assessments and by inadequately controlling for the tendency to select peers who are similar to oneself. Using detailed social network data from the National Longitudinal Study of Adolescent Health, we find support for both the socialization and opportunity models. Adolescents engage in higher rates of delinquency if they have highly delinquent friends and if they spend a great deal of time in unstructured socializing with friends. Yet our results also indicate that (1) the normative influence of peers on delinquency is more limited than indicated by most previous studies, (2) normative influence is not increased by being more closely attached to friends or spending more time with them, (3) the contribution of opportunity is independent from normative influence and of comparable importance, and (4) influences from the peer domain do not mediate the influences of age, gender, family or school.

Introduction

Interpersonal relations are a critical link between individual lives and the larger social structure. In this paper, we examine the contribution of peer relations to juvenile delinquency from the perspective of two sociological traditions. The first is the set of theoretical orientations that point to interpersonal relations as the avenue for normative influence, including symbolic interaction theory (Mead 1934), reference group theory (Newcomb 1950) and related conceptions of social influence (Simmel 1955; Sutherland and Cressey 1955). Here the attitudes, values and behaviors of individuals are influenced to become similar to those of their associates, and we will refer to that generic process as normative influence or socialization by peers. The second tradition is the social ecological approach seen in Hawley's (1950) work and elaborated in the routine activity perspective of Cohen and Felson (1979).[1] From this perspective, interpersonal relations are relevant as part of the process by which the social structure shapes the spatial and temporal contours of social life, thereby increasing opportunities for some behaviors and decreasing opportunities for others.

Peer relations have long been central to the study of delinquency (Short 1957), and for good reason. Adolescents spend much time with their friends, attribute great importance to them, and are more strongly influenced by them during this period than at any other time in the life course (Brown 1990). Also, delinquency has long been described as a companionate activity that typically involves co-offenders (Erickson and Jensen 1977; Hindelang 1976). The similarity of delinquency among friends remains one of the most consistent and strongest relationships in the literature (e.g., Agnew 1991; Elliott, Huizinga and Ageton 1985). Evidence of this association comes from observational research (Thrasher 1927), official data (Shaw and McKay 1942), and self-report studies (Short 1957).

Despite this history of interest, the contribution of peer relations to delinquency remains unclear. Though some theorists interpret peer similarity in delinquency as evidence of normative influence (Akers 1985; Sutherland and Cressey 1955; Warr 2002), others view it as a spurious result of peer selection (Glueck and Glueck 1950; Gottfredson and Hirschi 1990). Some of these issues have recently been resolved with Haynie's (2001, 2002) elaboration of the social network processes that contribute to higher levels of delinquency. Haynie's work is particularly noteworthy for its use of detailed friendship network information in the National Longitudinal Study of Adolescent Health. These data provide measures of friends' participation in delinquency based on friends' actual responses rather than the usual approach of relying on respondent perceptions of friends' behavior. Haynie's findings indicate that although adolescent delinquency is positively associated with friends' delinquency, network structure moderates the strength of the association. Specifically, adolescents in very dense friendship networks or in very central positions within their networks exhibit stronger peer-delinquency associations.

The present study goes beyond that research by returning to a more fundamental question: How do peers matter in regards to delinquency? Though many scholars portray normative influence from peers as the most important source of adolescent delinquency (e.g., Akers 1985; Elliott et al. 1985), we believe this remains an open question due to methodological limitations of available research. The present study uses improved methods to evaluate the strength of normative influence, to assess the role of peer delinquency in mediating the effects of other factors on delinquency, and to determine whether normative influence is contingent on the nature of peer relations. We also address an alternative way that peers might contribute to delinquency by considering opportunity theory's emphasis on spending time with friends as conducive to delinquency (Osgood et al. 1996).

Theoretical Connections Between Peer Relations and Delinquency

Peers as a Source of Normative Influence

In most social psychological accounts of larger social phenomena, normative influence or socialization from close associates is the key process by which individuals come to conform with the norms of their group. Various theories offer alternative portrayals of the processes by which interpersonal relations produce this socialization. For example, symbolic interactionism emphasizes the importance of the individual taking the perspective of others (Mead 1934). Reference group theory treats the individual's identification with others as key (Newcomb 1950). Social learning theory focuses on reinforcement and modeling (Akers 1985). Yet all agree on the centrality of normative influence.

Socialization theories are prominent in explanations of the relationship between crime and delinquency as well. Sutherland's (Sutherland and Cressey 1955) differential association theory and Akers' (1985) extension to differential reinforcement theory are specifically

devoted to this normative influence process. Though the generic socialization process applies to any ongoing and close interpersonal association, theories of crime and delinquency have been especially interested in peers as a source of normative influence. This emphasis can be traced back to the "cultural deviance" aspects of social disorganization theory (Shaw and McKay 1942; Thrasher 1927). It appears in theories that treat strain (Cohen 1955; Cloward and Ohlin 1960) or labeling (Tannenbaum 1938) as the reason that youths join delinquent groups, and it is a major theme of integrated theories (Elliott, Ageton and Canter 1979; Thornberry 1987). All of these theories view delinquent friends as having direct influence on adolescents' own delinquency.

It is difficult to overstate the importance attributed to normative peer influence in the study of crime and delinquency. It is the key causal process in many theories, and studies often report peer delinquency to be the variable with the strongest influence on respondents' delinquency (e.g., Akers et al. 1979; Elliot et al. 1985; Warr 1993b). Furthermore, several studies have concluded that peer delinquency accounts for the association of delinquency with other major correlates including age (Warr 1993a), attachment to parents (Warr 1993b), and measures of normlessness and strain (Elliott et al. 1985).

Methodological Issues in the Assessment of Normative Influence

One purpose of the present study is to determine whether methodological shortcomings have led to a serious overestimation of the importance of the normative influence of peers on delinquency. Assessing interpersonal influence is complex because similarity between friends could result from either normative influence or social selection. The ubiquitous tendency to choose friends who are similar to oneself holds for qualities ranging from age, sex and race to attitudes, personality and behavior (Blau 1977; McPherson and Smith-Lovin 1987). Indeed, some scholars have taken the extreme position that peer similarity for delinquency is entirely a result of self-selection. For instance, Glueck and Glueck (1950) concluded that delinquency precedes these friendships, and Hirschi (1969) argued that delinquent youth have no choice for friends except other delinquents.

It is at least as plausible, however, that both socialization and selection would contribute to similarity. In fact, the theories of both Elliott et al. (1979) and Thornberry (1987) imply that delinquent peer groups and normative influence are reciprocally related, and there is empirical evidence that both processes are at work (Kandel 1996; Matsueda and Anderson 1998). This more temperate view of normative influence is consistent with prior studies finding that the effect of peer delinquency declines, but is not eliminated, upon the addition of controls for selection (Haynie 2002; Krohn et al. 1996; Matsueda and Anderson 1998).

A second methodological concern is that the standard approach to measuring peer delinquency contains a same-source bias that substantially inflates similarity between peers. In almost all criminological studies, information about friends comes from adolescents' descriptions of the behavior of their friends rather than from those friends' reports of their own behavior. Such measures inflate the correspondence between respondents and their peers because people tend to project their own attitudes and behavior onto their friends, a phenomenon social psychologists refer to as *assumed similarity* or *projection* (Byrne and Blaylock 1963; Newcomb 1961).[2] Though such findings have led several scholars to caution against the use of respondents' reports about peers (Aseltine 1995; Bauman and Ennett 1994; Jussim and Osgood 1989; Kandel 1996; Wilcox and Udry 1986), there has been little recognition of this problem in research on crime and deviance. Such findings show that there is some truth in Gottfredson and Hirschi's (1990:157) argument that respondents' reports of their peers' delinquency "may merely be another measure of self-reported delinquency."

By inadequately controlling for selection processes and by using adolescents' reports of their friends' behaviors, previous studies have over-estimated the contribution of peer socialization to delinquency. Indeed, Kandel (1996) concluded that, in combination, these two methodological factors may lead to a five-fold over-estimation of normative influence on adolescent deviance. The study we present below builds upon Haynie's (2001, 2002) recent work by addressing the peer selection issue through a longitudinal research design and the inclusion of an extensive set of control variables including a measure of prior delinquency. Also, we follow Haynie in employing a network-based measure that uses friends' own reports of their delinquency.

Peers as a Source of Opportunity for Delinquency

In the first tradition we considered, interpersonal relationships are important because they integrate individuals into normative communities. In contrast, the second tradition sees interpersonal relationships as important for structuring everyday life and thereby shaping opportunities for different types of behavior. This opportunity perspective need not be seen as contradicting the socialization perspective, and the causal processes it specifies may well coexist with that form of social influence.

The opportunity perspective traces to Hawley's (1950) theory of social ecology, which analyzes social structures in terms of both systems of symbiotic relationships among actors and the spatial and temporal patterning of everyday activities necessary to meet basic needs. Cohen and Felson (1979) used Hawley's (1950) approach as the basis for their innovative routine activity approach to the analysis of crime. These theories highlight the way in which these processes determine opportunities for crime and thereby affect macro-level rates and patterns of offending and victimization. Osgood and colleagues' (1996) extension of their work is most relevant to our purposes because it concerns individual offending and includes a prominent role for peers.

Osgood and colleagues' (1996) explanation of deviance combines (1) the routine activity perspective's emphasis on activities away from household and family as creating opportunities for crime and deviance (Felson 2002), (2) situationally based motivational concepts found in some theories of delinquency (Briar and Piliavin 1965; Gold 1970), and (3) findings from studies relating deviant behavior to adolescents' ordinary, everyday activities (e.g., Agnew and Peterson 1989; Riley 1987). Osgood and colleagues (1996) proposed that situations conducive to deviance are especially prevalent during unstructured socializing with peers in the absence of authority figures. They argued that the presence of peers makes deviant acts easier and more rewarding, the absence of authority figures reduces the potential for social control responses to deviance, and the lack of structure leaves time available for deviance. Therefore, individuals who spend more time in unstructured socializing activities will also more frequently engage in delinquency and other deviant behavior. Osgood et al. (1996) demonstrated that within-individual change in unstructured socializing activities (but not other activities) was strongly related to delinquency and several measures of substance use.

From this opportunity perspective, peer relations are not connected to delinquency by the type of friends that one chooses. Instead, what matters is the amount of time spent with peers engaged in a common type of activity that is not inherently deviant. Following Gold (1970), Osgood and colleagues (1996) saw peers as important because delinquency is often a performance, and peers serve as the appreciative audience. This perspective is also consistent with Gold's (1970) portrayal of delinquency as similar to a pick-up game of basketball in being casual, spontaneous and loosely organized. For example, Gold noted that

"more important than the particular company [that a youth keeps] was the presence of an opportunity for delinquency when everyone's mood was ripe for action." (p.119)

A potential challenge to this opportunity explanation is the possibility that the association between delinquency and unstructured socializing is a byproduct of the socialization process discussed above. Socialization could produce this relationship if youths who spend the most time this way also have delinquent friends. Thus, one of the purposes of the present study is to determine whether unstructured socializing is still related to delinquency after controlling for peer delinquency.

Interactive Effects of Peer Dimensions

These two theoretical traditions also differ in their implications for whether dimensions of peer relations will interact in relation to delinquency. Socialization theories have long been concerned with the way in which normative influence may depend on the individual's relationship with the group (Mead 1934; Newcomb 1950). Sutherland and Cressey (1955) specified that normative influence is conditioned by the frequency, duration, priority and intensity of associations with a group. Drawing on Sutherland and Cressey, Akers (1985) saw increased time spent with peers as providing more exposure to models and a more extensive history of reinforcement by the group. Similarly, attachment to peers is important and enhances the value of reinforcement from the group, thereby increasing the odds that the individual will imitate the group's behavior. Accordingly, Agnew (1991) found that the relationship of peer delinquency to respondents' own delinquency was considerably stronger for respondents who were more attached to their peers and who spent more time with them.

The relationship between peer delinquency and time spent with peers is also relevant to the opportunity perspective. If opportunity dynamics depend on the peers being delinquent, then the individual's delinquency would be an interactive function of the amount of time spent in unstructured socializing and peer delinquency, as with the socialization perspective. Though such an interaction is consistent with the opportunity perspective, it is not required. Osgood and colleagues (1996: 639) endorsed Matza and Sykes' (1961) position that "subterranean values" supportive of delinquency are a part of the general culture. Thus, when away from the watchful eyes of authority figures, even peers who are not especially delinquent will often react positively to the excitement, conspicuous consumption and toughness inherent in most delinquent acts. This subtle distinction is critical to the importance of the opportunity perspective. If the contribution of time spent with peers is totally dependent on the delinquency of those peers, then the opportunity perspective merely provides an additional reason why frequency of interaction moderates the influence of peer delinquency. Opportunity would play a more primary role if spending more time in unstructured socializing were associated with higher levels of delinquency whether or not one's associates were especially delinquent.

Our research will improve upon previous studies of interactions among peer dimensions by overcoming weaknesses in the standard methodological approaches used in studies such as Agnew (1991). Like most other researchers, Agnew relied on respondents' reports about their friends' delinquency and did not control for peer selection processes. An additional problem is that spurious interactions systematically arise when ordinary least squares regression (OLS) is applied to limited and skewed dependent variables (Osgood, Finken and McMorris 2002), and this must be overcome by applying alternative statistical models (e.g., tobit, poisson) appropriate to distributions of delinquency.

The Present Study

Our research addresses the following hypotheses derived from the socialization and opportunity perspectives reviewed above.

Socialization Theory

> **Primary hypothesis:** Adolescents whose friends are more delinquent will engage in more delinquency themselves, even after controlling for selection processes.
> **Secondary hypothesis:** The relationship of peer delinquency to adolescents' own delinquency will be stronger when adolescents are more attached to those peers and when they spend more time with them in unstructured socializing.
> **Secondary hypothesis:** Peer delinquency will mediate much of the influence of other variables that are reliably associated with delinquency, such as age, attachment to parents and school grades.

Opportunity Theory

> **Primary hypothesis:** Adolescents who spend more time in unstructured socializing with friends, away from authority figures, will engage in more delinquency even when controlling for peer delinquency.
> **Secondary hypothesis:** Time spent in unstructured socializing may be more strongly related to delinquency if one's friends are more delinquent. Even for respondents whose friends are not at all delinquent, however, unstructured socializing will produce higher rates of delinquency to at least some degree.

Previous Evidence from the National Longitudinal Study of Adolescent Health

The present study relies on data from the National Longitudinal Survey of Adolescent Health (henceforth, Add Health), which includes the information necessary for constructing network-based measures of peer delinquency. Though Haynie's (2001) study of peer networks had different aims than the present research and did not specifically discuss the hypotheses being addressed here, results bearing on some of them were reported. Specifically, tables included estimates of the relationships of respondents' delinquency with peer delinquency and unstructured socializing (referred to as friend involvement). These results provided evidence that peers are a source of both normative influence and opportunity for delinquency. Yet with a standardized coefficient of .13 for friends' delinquency (Haynie 2001, p. 1039), normative influence did not appear to be the dominant causal process envisioned in much of the criminological literature. The standardized coefficient for unstructured socializing was .18, suggesting that opportunity processes play at least as large a role in delinquency.

The present study addresses hypotheses about the mediating role of peer delinquency and about interactions among peer delinquency, attachment to peers and unstructured

socializing with peers. It also will explore the strength of normative influence and include the measure relevant to opportunity theory. We have refined measures of the key peer variables for peer delinquency and unstructured socializing, and improved the controls for selection of similar friends by extending the list of control variables and by adding a longitudinal analysis.

Methods

Sample

The Add Health survey provides data for a nationally representative sample of adolescents in grades 7 through 12, who were attending 132 schools selected with unequal probability in the United States in 1995-1996. Incorporating systematic sampling methods and implicit stratification into the study design results in a sample of schools representative of U.S. schools in terms of region of the country, urbanicity, school type, ethnic makeup of the schools and school size (Bearman, Jones and Udry 1997). Our research relies on the in-school and in-home surveys conducted in 1995 and on the second in-home survey conducted in 1996. The sample for the in-school self-administered questionnaire included every student (who was present on the day of the interview) in each school, whereas the in-home survey was limited to a random sample of students whose names appeared on school rosters or who were found in the school on the day of the in-school interview. Most of our measures come from the in-home survey, which was more extensive and also included more sensitive questions than did the in-school survey. The response rates for the in-home survey were 78.9 percent at Wave I and 88.2 percent at Wave II. Some of our analyses are limited to a portion of the Add Health data known as the "saturation sample," which consists of the 16 schools at which all students (rather than a random sample) were selected for the in-home interviews. (See Haynie 2001, 2002 for greater detail.)

To measure the social networks of the students at each school, the in-school survey asked students to nominate up to five of their closest female friends and five of their closest male friends (for a maximum of 10 friends). By linking these nominations to the friends' responses about their own involvement in deviant activities, researchers can construct network based measures of peer relationships and peer characteristics. (For example, see Haynie 2001, 2002.)

There are two potential limitations of the network data used in this study. First, adolescents were limited to 10 friendship nominations, which places an artificial boundary on the friendship networks. However, the mean number of friends nominated is 5.7, indicating that most students do not use all of the choices available to them. Therefore, it is unlikely that the design seriously distorts the actual number of friendship choices made by each student.[3] The second limitation is that adolescents' friendships outside of school are not captured in the study, which suggests that the friendship networks may be incomplete. Fortunately, out-of-school friendship choices were relatively uncommon as adolescents on average nominate 1.25 friends not located in the school. This pattern of nominating largely school friends is consistent with other research indicating that most adolescent friendships are between adolescents in the same school (Blythe, Hill and Thiel 1982; Coleman 1961), suggesting that schools form the primary natural boundaries for adolescent social networks. Thus, a school-based research design is a practical and efficient approach to studying adolescent friendship networks on a large scale. Even so, this approach will tend to under-represent the role of drop-outs and peers from other schools in friendship networks.

The final sample consists of 8,838 respondents who provided information for all three phases of data collection (in-school survey, time 1 in-home interview, and time 2 in-home

interview), for whom network information was available, and whose parent completed an initial in-home survey. For the supplementary analyses that involved the smaller saturation sample we draw upon interviews with 2,274 respondents.

Measures

Dependent variable. Our measure of delinquency derives from responses to a series of 14 delinquency items collected during both in-home interviews. To enhance anonymity, respondents listened to these pre-recorded questions on earphones and entered their responses directly into laptop computers (Bearman, Jones and Udry 1997). The 14 delinquency items include: paint graffiti, damage property, shoplift, steal something worth less than $50, steal something worth $50 or more, burglarize, steal a car, sell drugs, engage in a serious physical fight, seriously injure another, use or threaten to use a weapon, participate in a group fight, pull a knife or gun on someone, and shoot or stab someone (alpha = .86).[4] The questions ask students to report how often during the past 12 months they have participated in these activities. Each delinquent act is coded from 0, if respondents did not participate during the past year, to 3, if respondents participated in the act several times.

We computed delinquency scores with the item response theory (IRT) scaling methods described by Osgood, McMorris and Potenza (2002). IRT scaling is especially advantageous for the highly skewed items comprising most measures of deviance because it translates the discrete categories of the response scale to a shared dimension that is continuous and has an equal-interval metric. Our IRT scoring employed Samejima's (1969) graded response model, which makes full use of the ordinal information in every item. We scored both waves of data jointly so that the two sets of delinquency scores would be fully comparable.

Peer delinquency. A central feature of our research is the use of network data to measure peer delinquency rather than relying on respondent's reports about their friends. Because each adolescent in the Add Health study had the opportunity to nominate friends during the in-school survey (time 1), and almost every adolescent in the respondent's school completed a questionnaire for the in-school survey, it becomes possible to measure most friends' behaviors based on the friends' actual responses to survey items.

To calculate peer delinquency, we first defined the respondent's peer network to include all those adolescents whom the respondent nominated as a friend, as well as any adolescents who nominated the respondent as a friend (i.e., the send-and-receive network).[5] Our analyses made use of two measures of peer delinquency. The first is based on a brief series of questions about involvement in minor deviant acts, which was included in the in-school survey. Specifically, each friend was asked how often during the past year he or she had gotten drunk, smoked cigarettes, skipped school without an excuse, and been involved in serious physical fights (alpha = .69). Responses to each item ranged from 0, indicating never, to 5, indicating three to five days a week. For the saturation sample, where all students in the school (rather than a sample) completed the in-home interview, we are able to create a second peer delinquency measure based on friends' responses to the same delinquency items used to measure the dependent variable (alpha = .79).

To obtain a fair assessment of the strength of normative influence, it is important to score peer delinquency in a manner that best captures its relevance to respondents' own delinquency. The method that proved most effective was to IRT score each friend's responses and to take the average of those IRT scores across the friends. IRT scoring has potential advantages for this purpose because it produces an empirically derived metric for the individual scores that will be approximately normally distributed, makes use of all of the information in the

measure to distinguish the full range of offending, and minimizes the potential for extreme outliers. This approach yielded relationships with respondents' delinquency that were considerably stronger than those obtained by averages of simple summative scores, the count of delinquent friends or the proportion of delinquent friends (Haynie 2002).

Unstructured socializing. Our measure of *unstructured socializing* is based on three questions. For each friendship nomination, respondents indicated whether they met the friend after school to "hang out" and whether they spent time with the friend over the past weekend. For each question (asked for each nominated friend) responses are coded either 0, indicating no or 1, indicating yes. In addition to these two questions, respondents were asked in general "during the past week, how many times did you just hang out with friends?" and responses to this question ranged from 0, indicating "not at all" to 3, indicating "5 or more times." This measure is designed to focus more specifically on time spent socializing in a relatively unstructured way. Even so, the included items are not strictly limited to time away from authority figures, as stated in Osgood et al.'s (1996) opportunity theory. To the degree that our measure did not fully isolate the type of time use specified by the theory, our results are likely to be a somewhat conservative estimate of the relevant effects.

For the network questions asked of each friend, we created an index of unsupervised association with friends by first summing the responses to the network items for each friend, summing those sums across the friends, and dividing by the square root of the number of friends.[6] The second step involved standardizing that composite, as well as the single non-network item, and summing those two values (alpha = .75). Of interest, the correlation between peer delinquency and peer unstructured socializing is modest ($r = .16$), showing that these two key concepts are empirically quite distinct.

Control variables. We include a large set of control variables to account for possible selection effects. Among these are a variety of demographic variables that have often been associated with delinquency in prior research: *gender* (1 = female, 0 = male), *race* (measured with two dummy variables: one coded as one for African American respondents and the other coded as one for races other than African American and non-Hispanic white; thus, non-Hispanic white is the reference group), *family structure* (1 = lives with two married parents, 0 = other family structures), *age* (measured in years) and age squared (to allow for a curvilinear relationship),[7] and two measures of *social class* based on responses from parents elicited during the in-home interview. These are a measure of parent's educational level indexing the highest level of schooling achieved (of the more educated parent) which ranges from 0 = no formal education to 9 = professional training beyond a four-year college or university, and receipt of public assistance (1 = received public assistance during the past year, 0 = did not).[8]

Social control variables. Measures of social control served as additional control variables. Though previous research does not support Hirschi's (1969) prediction of a social control effect of attachment to peers, a measure of this variable is necessary for testing the socialization perspective's hypothesized interaction effects. We measured *peer attachment* through responses to the question, "How much do you believe that your friends care about you?" Responses range from 0, not much at all, to 5, they care very much about me. It would be more consistent with previous measures of attachment if the question inquired about the respondents' sentiments toward their friends (e.g., Hirschi 1969). Unfortunately, no such item was available, so we must rely on the general tendencies for respondents to assume that their friends feel similar to themselves.

Unlike peers, there is consistent evidence that social controls in other domains reduce delinquency. We include two measures of parental controls. *Attachment to parents* is measured

as an index combining responses to the following questions: "how close to you feel to your [mother/father]" and "how much do you think your [mother/father] cares about you?" (alpha = .69). The second is a measure of *parental supervision* (alpha = .60) based on adolescents' responses to six questions about their mother's and father's physical presence in the home at various times of day: when the adolescent leaves for school, returns from school, and goes to bed. Responses ranged from 1, never, to 5, always. Though this measure does not exhaust relevant aspects of supervision, it does tap the critical component of parental availability.

In addition to control by parents, we include social controls in relation to school. The first of these is the adolescent's self-reported *grade point average* (based on grades earned during the past year in math, science, English and history), which would reflect commitment to conventional lines of success. The second is the respondent's *attachment to school* (measured as an index combining responses to the following questions: "do you feel close to people at your school," "do you feel like you are part of your school," and "are you happy to be at your school") (alpha = .78). The last social control variable we include is a measure of the *importance of religion* to the respondent. This is based on one item that asks respondents to indicate: "how important is religion to you: very important, fairly important, fairly unimportant, or not important at all?" Table 1 presents the descriptive information on all variables included in the analyses.

Table 1: Descriptive Statistics

Variables	Complete Sample			Saturation Sample		
	Mean (Proportion)	Std. Deviation	Range	Mean (Proportion)	Std. Deviation	Range
Delinquency (W2)	-.17	.93	-.91–3.50	-.14	.95	-.91–3.50
Delinquency (W1)	.05	.99	-.91–3.50	.12*	1.03	-.91–3.50
Peer Delinquency (minor)	.00	1.00	-1.63–4.02	.00	1.00	-1.13–4.34
Peer Delinquency (serious)	N.A	N.A.	N.A.	.00	1.00	-1.57–4.11
Unstructured Socializing	.00	1.00	-2.25–2.55	.00	1.00	-2.47–2.75
Female	.53	.50	0–1.00	.42*	.49	0–1.00
Black	.22	.41	0–1.00	.14*	.35	0–1.00
Other Race	.25	.43	0–1.00	.34*	.48	0–1.00
Age	15.24	1.55	12.00–20.00	15.72*	1.49	12.00–20.00
Age Squared	1.00	1.14	10.56–22.66	1.00	1.30	10.56–22.66
Public Assistance Receipt	.07	.26	0–1.00	.05*	.22	0–1.00
Parents' Education Level	6.16	2.05	0–9.00	5.94*	2.06	0–9.00
Two-Parent Family	.73	.44	0–1.00	.75*	.43	0–1.00
Friend Attachment	.00	1.00	-4.17–.96	.00	1.00	-4.05–.98
Parental Attachment	4.64	.55	0–5.00	4.59*	.58	0–5.00
Parental Supervision	11.37	2.09	3.00–15.00	11.28	2.08	3.00–15.00
Importance of Religion	3.08	1.04	1.00–4.00	3.15*	1.00	1.00–4.00
School Attachment	3.81	.84	1.00–5.00	3.80	.83	1.00–5.00
Grade Point Average	2.82	.75	1.00–4.00	2.74*	.78	1.00–4.00
Number of Friends	5.27	3.13	0–10.00	4.19*	3.38	0–10.00
N	8,838			2,274		

* Indicates a significant difference across samples (p < .05).
Note: Age was mean centered before forming the squared term.

Analytical Strategy

Selection Effects

Fully controlling for selection effects would require randomly assigning respondents to settings with different groups of potential friends, and short of that it would be desirable to have assessed friends' delinquency before the beginning of the friendship.[9] Though we did not have access to such data, we believe that our statistical controls for selection are at least as strong as those in any previous research on peer effects for delinquency. To control for selection effects we must take into account the factors that lead adolescents to choose a particular group of friends and that are also associated with their own delinquency. We take two approaches to this problem. The first is to control for the 13 factors listed above, which previous research has shown to be associated with delinquency, a far more extensive list than included in most studies of peers and delinquency.

The limitation of this first approach is that there may well be unmeasured variables that affect both peer selection and delinquency. Recent longitudinal analyses by Ackerman (2003) suggest that this problem is not too dramatic in the Add Health data; a more limited set of controls was sufficient to account for almost all of the tendency to select friends with similar levels of delinquency. Another approach to eliminating all possible selection factors would be, in effect, to control for the dependent variable. We can accomplish a version of this by treating delinquency at Wave 2 as the outcome measure while using the Wave 1 measures of peer relations as explanatory variables and the Wave 1 measure of delinquency as a control variable. Any variance in friends' delinquency that is attributable to selection factors relevant to delinquency is necessarily shared with the contemporaneous measure of delinquency, and this approach eliminates that variance from the estimate of normative influence. Longitudinal data have been used in this fashion before (e.g., Matsueda and Anderson 1998), but only in studies that relied on respondents' reports of friends' delinquency.

The shortcoming of this second approach is that it is likely too strong a control for selection factors, thereby underestimating the contribution of peer relations to delinquency. This approach narrows the focus of the analysis to delayed effects of peer relations on delinquency measured one year later. It will capture neither concurrent influence, which is removed by controlling for earlier delinquency, nor influence over a longer delay. A delayed effect is plausible for friends' delinquency because socialization should be a cumulative rather than instantaneous process. Even so, we have no basis for predicting a specific causal lag of one year. This approach seems especially likely to underestimate effects of unstructured socializing, which should have concurrent rather than delayed effects because opportunities for delinquency should arise while spending time with friends.

We therefore view the two sets of estimates as upper and lower bounds on the effects of peer relations on delinquency. The first set, providing the upper bound, come from a cross-sectional analysis of Wave 1 delinquency, using Wave 1 measures of all explanatory and control variables. The second set, providing the lower bound, come from a longitudinal analysis of Wave 2 delinquency, again using Wave 1 measures of all explanatory and control variables, and also controlling for Wave 1 delinquency.

Statistical model. When testing for statistical interactions, it is especially important to select a statistical model that is well-suited to the distribution of the outcome measure (Osgood and Rowe 1994). The IRT measurement approach we used to scale delinquency produces a measure that approximates the normal distribution except for a substantial floor effect due to the many respondents who report committing none of the delinquent acts (43 percent in

wave 1 and 54 percent in wave 2). Following Osgood et al. (2002a), we analyze our data using the tobit regression model, which is designed for such a truncated normal distribution (Long 1997). They demonstrated that the tobit model is well-suited to delinquency data, provided that the measure has been transformed to approximate normality. Preliminary analyses indicated that the tobit model was an equally good match to our IRT measure of delinquency. Coefficients from tobit have the same interpretation as those from OLS regression, except that they refer to the untruncated dimension presumed to underlie the observed measure.

Results

Overall Effects of Peer Relations

Peers as a source of normative influence. The results in Table 2 address our primary hypotheses about how peer relations would be associated with delinquency. We assess socialization, or the normative influence of peers, by the effect of the delinquency of the respondents' friends. This effect is statistically significant both after controlling for many other potential causes of delinquency (the cross-sectional model) and also after controlling for a contemporaneous measure of delinquency (the longitudinal model). Therefore, we are confident that peer socialization has a meaningful causal influence on delinquency, contrary to claims that this association is entirely attributable to respondents choosing friends who are similar to themselves.

Yet our findings also show that most studies have substantially overestimated normative influence by relying on respondent's reports about their friends and by failing to control for selection processes. Such studies typically conclude that peer delinquency is an exceptionally powerful predictor of delinquency, dominating all other social influences on delinquency with a standardized effect of about .5 (e.g., Akers et al. 1979; Elliot et al. 1985; Matsueda 1982). In contrast, our estimate for the standardized effect[10] of friends' delinquency is an upper bound of .14 and a lower bound of .05. Thus, normative influence is no more important to delinquency than are many other well established predictors found in Table 2.

Peers as a source of opportunity. Our second theoretical perspective focuses on interpersonal relations as a potential source of opportunities for deviance, which we measure in terms of time spent in unstructured socializing. Our central question about this perspective is whether the association of delinquency with unstructured socializing is a spurious byproduct of the influence of delinquent friends. Table 2 reveals that this is not the case. Unstructured socializing is significantly associated with delinquency in both the longitudinal and cross-sectional analyses, with standardized coefficients of .13 (upper bound) and .04 (lower bound). The magnitude of the effect of unstructured socializing is comparable to that of normative influence and also to the effects of relations with parents and school, all of which are long established as central to theories of delinquency and adolescent deviance.

Interactive Effects of Peer Relations

Table 3 presents our findings concerning the interactive effects of the peer dimensions on delinquency.[11] We find no evidence that the impact of friends' delinquency is greater either when respondents feel closer to their friends or when they spend more time in unstructured socializing with their friends. Indeed, none of the interaction effects approach statistical significance, and three of our four estimates of the interaction are in the opposite direction.

Table 2: Tobit Regression Estimates Relating Explanatory Variables to Self-reported Delinquency, Complete Sample.

Explanatory Variable	Cross-Sectional Results				Longitudinal Results			
	b	b*	S.E.	t	b	b*	S.E.	t
Peer Delinquency (minor)	.15	.14	.01	12.77	.06	.05	.01	5.19
Unstructured Socializing	.14	.13	.01	11.83	.05	.04	.01	4.14
Prior Delinquency	—	—	—	—	.56	.48	.01	45.01
Female	-.45	-.20	.02	-18.63	-.20	-.08	.02	-8.50
Age	-.10	-.15	.00	-13.47	-.08	-.10	.00	-10.36
Age squared	-.02	-.02	.01	-2.04	-.00	-.00	.01	-.98
Black	.20	.07	.03	6.58	.04	.01	.03	1.49
Other Race	.25	.10	.02	9.09	.06	.02	.02	2.17
Two-Parent Family	-.01	-.04	.02	-3.68	-.03	-.01	.02	-1.30
Public Assistance	.09	.02	.04	2.06	.05	.01	.04	1.11
Parents' Education	.00	.01	.00	1.30	.00	.01	.00	1.10
Parental Surveillance	-.03	-.05	.00	-5.50	-.01	-.02	.00	-2.04
Attachment to Friends	-.01	-.01	.01	-1.30	.03	.02	.01	2.83
Parent Attachment	-.23	-.12	.02	-10.95	-.08	-.03	.02	-3.95
Importance Religion	-.06	-.05	.01	-5.59	-.02	-.02	.01	-2.38
School Attachment	-.15	-.11	.01	-10.71	-.03	-.02	.01	-2.77
Grade Point Average	-.23	-.16	.01	-14.49	-.08	-.05	.01	-5.50
Number of Friends	.02	.08	.00	7.06	.01	.03	.00	3.09
Constant	4.51		.18	24.15	1.96		.19	10.34
S	.96		.01		.88		.01	
Log Likelihood	-9434.149				-7682.6			
Likelihood Ratio x² for Model	1842.2				3253.7			
R²	.23				.42			

Note: b* is the standardized tobit coefficient and s is the standard deviation of residuals.

Table 3: Interaction Models for Complete Sample

Main components of Interaction	The Interaction of Unstructured Socializing and Peer Delinquency					
	Cross-Sectional Results			Longitudinal Results		
	b	S.E.	t	b	S.E.	t
Peer Delinquency (minor)	.16	.01	12.77	.06	.01	5.31
Unstructured Socializing	.14	.01	11.81	.05	.01	4.18
Unstructured Socializing * Peer Minor Delinquency	-.00	.01	-.75	-.01	.01	-1.30
Prior Delinquency	------	------	------	.56	.01	45.01
s	.95			.88		
Log Likelihood	-9433.5			-7681.8		
Likelihood Ratio x^2 for Model	1842.7			3255.4		
R^2	.23			.41		

Main components of Interaction	The Interaction of Peer Attachment and Peer Delinquency					
	Cross-Sectional Results			Longitudinal Results		
	b	S.E.	t	b	S.E.	t
Peer Delinquency (minor)	.16	.01	12.79	.06	.01	5.08
Attachment to Friends	-.01	.01	-1.37	.03	.01	2.93
Attachment to Friends * Peer Minor Delinquency	.00	.01	.86	-.01	.01	-1.09
Prior Delinquency	------	------	------	.56	.01	45.02
s	.96			.88		
Log Likelihood	-9433.8			-7682.0		
Likelihood Ratio x^2 for Model	1842.9			3254.9		
R^2	.23			.41		

Note: All models include control variables listed in Table 2. S is the standard deviation of residuals.

For socialization theories, the importance of this result is that the degree of normative influence is relatively independent of these other dimensions of peer relationships. Given our large sample size, we would be able to detect even a moderate interaction effect. If adolescents regard one another as friends, they tend to influence one another whether or not they feel strongly attached to one another or spend an exceptional amount of time together. The interaction results provide critical support for a routine activity perspective on peers and delinquency. Spending lots of time "hanging out" with friends is conducive to delinquency, even if those friends are not especially delinquent themselves. This finding answers a fundamental challenge to the socialization explanation by showing that the relationship of activities to delinquency is not a secondary byproduct of normative influence by peers. Thus, these findings are consistent with interpreting this relationship as reflecting the contribution of situational opportunities.

Normative Influence as a Mediator of Effects of Other Variables

The final substantive issue we investigate is the degree to which normative influence is an essential causal process that accounts for the relationship to delinquency of other important variables. To address this, we turn to the variables that have served as statistical controls in the previous analyses, which include prominent correlates of delinquency such as gender, age and school performance. We compared the coefficients for those variables from two models, the first without peer delinquency (a reduced form model) and the second including peer delinquency. To the degree that normative influence mediates the contributions of those variables, their coefficients will be closer to zero in the second model.

The comparison between these models indicates that the mediating role for peer delinquency is limited in both cross-sectional and longitudinal analyses. The greatest proportionate reduction in coefficients was for public assistance, importance of religion and grade point average; peer delinquency accounts for 10 to 20 percent of the relationships of these variables to respondents' delinquency. The relationships of age and race to delinquency actually became stronger after adjusting for peer delinquency. In sum, our findings are in contrast to studies indicating that peer delinquency fully mediates the effects of age (Warr 1993a) and attachment to parents (Warr 1993b) on delinquency. Our mediation findings are not surprising, however, in the context of the rest of our results. Our improved controls for selection and independent assessment of peer delinquency produced a much lower estimate of normative influence than was found in those studies, which in turn means that peer delinquency has little potential to mediate the effects of other factors.

Supplementary Analyses

The analyses in Tables 2 and 3 rely on a measure of friends' delinquency that is limited to offenses that are less serious than most offenses included in the measure of respondents' delinquency. It is possible that this difference would lead to underestimating the extent of normative influence. As discussed above, a measure of friends' delinquency that matches the measure of respondents' delinquency was available for respondents who attended schools at which all students were selected for the in-home interview. Additional analyses using this measure of friends' more serious delinquency produced essentially identical estimates of the strength of socialization by peers (lower- and upper-bound standardized estimates of .134 and .057) and yielded no evidence that normative influence depends on attachment to friends or unstructured socializing.

An alternative statistical model. One limitation of our primary analyses is that they do not take into account the stratified and clustered sampling design of the Add Health study, which may lead to underestimating standard errors. To ensure that this issue did not bias our results, we repeated our analyses using the Stata program's (1997) negative binomial regression model, which can incorporate adjustments for this sampling design. We also scored delinquency as the sum of dichotomously coded items (Hindelang, Hirschi and Weiss 1979) to obtain the integer values necessary for this analysis (Gardner, Mulvey and Shaw 1995). Results from this analysis are in close agreement with those of the tobit analyses, giving strong support to all of the same conclusions.

Discussion

This study has examined the contribution of peer relations to juvenile delinquency from two perspectives about the role of interpersonal relations in linking individual lives to the social structure. The socialization perspective views peers as a source of normative influence, whereas the opportunity perspective focuses on time spent with peers as a potential source of opportunities that promote delinquency. As we noted earlier, the two perspectives are compatible with one another, and our results provide support for both.

For the opportunity or routine activity perspective, we addressed the critical question of whether the connection of delinquency to time spent with peers is better explained by opportunity processes or by normative influence. Osgood and colleagues' (1996) routine activity explanation claims that adolescents who spend more time in unstructured socializing with peers, away from authority figures, have higher rates of delinquency because they more often encounter situations conducive to deviance. This explanation would not hold, however, if the relationship between time use and delinquency could be accounted for by the delinquency of the respondents' friends.

Our results support the validity of the opportunity explanation. The relationship between unstructured socializing and delinquency remained after controlling for friends' delinquency. Furthermore, tests for interaction effects revealed that the association between time use and delinquency was at least as strong for respondents with more conventional friends as for those with delinquent friends. This pattern supports Osgood and colleagues' (1996) supposition that support for "subterranean values" (Matza and Sykes 1961) is sufficiently widespread that even relatively non-delinquent youth can spur one another on to deviant behavior.

Considering the central place of socialization explanations in the study of deviance, it is disappointing that research on this question has been plagued by long-known methodological shortcomings. Our efforts to overcome those weaknesses produced a picture of normative influence as a modest influence on delinquency, much weaker than is claimed by researchers who portray this socialization as its dominant proximal cause. This finding is striking because our approach matches most prominent studies in features such as using broad measures of respondent and peer delinquency (e.g., Akers et al. 1979; Elliot et al. 1985; Matsueda 1982) and because we developed a scoring method that maximized the relationship between our measures of peer delinquency and respondent delinquency.

Overestimating the effects of peer delinquency in past research has also resulted in underestimating the influence of other factors. For example, in contrast to Warr's (1993a, 1993b) results, we find that controlling for peer delinquency produces no reduction in the effects of age and attachment to parents. Furthermore, it is likely that these same methodological weaknesses have distorted the findings of many studies that pit normative influence against other causal processes.

We add our voices to the group of scholars who have concluded that it is inappropriate to investigate normative influence by using respondents' reports as indicators of the attitudes, values or behaviors of others. More suitable sources include the peers themselves (as in our study), parents, teachers, fellow students (Cairns and Cairns 1994), and direct observations (Dishion et al. 1996). The expense of coordinating data collection across multiple sources means that strong studies of large representative samples will continue to be rare. Therefore, progress in research on normative influence will require that researchers be creative in designing studies and that editors and reviewers appreciate that the validity of research on normative influence appears to be more dependent on research designs than sampling.

We also failed to find support for the socialization perspective's prediction that normative influence would be stronger for respondents who were more closely attached to their friends or who spent more time with their friends. It is important to remember that, because we

consider only influence from *friends*, our analysis is restricted to a limited range of attachment to peers. Findings regarding attachment might be quite different if we also assessed influence from peers who were not friends. Gold and Osgood's (1992) study of influence among incarcerated adolescents indicates that this may be the case. Those peer groups were in near-constant interaction, but members had virtually no choice about their associates. In that setting there was greater influence when respondents felt more closely attached to peers.

In sum, our findings paint a complex picture of delinquency as arising from many sources and by several processes. Two sociological perspectives have guided our work, and we have found that they both provide valuable insights about how relations with peers are linked to individual delinquency: Adolescents engage in more delinquency if they have delinquent friends or if they spend a great deal of time in unstructured socializing with friends. Yet these influences from the peer domain are no more or less important than social control processes in the realms of family and school. Finally, despite controlling for a large set of predictors associated with many of the prominent theories of crime and delinquency, the standard demographic variables of sex, age and race/ethnicity remain strongly related to delinquency, meaning that those theories do not appear to account for these fundamental relationships.

Notes

1. Social control theory (Hirschi 1969) offers a third theoretical perspective on the connection of interpersonal relations to delinquency. We do not include social control in this paper, however, because many previous studies have failed to find support for its predictions concerning peers and delinquency (e.g., Elliott and Voss 1974; Erickson and Empey 1965; Hindelang 1973), and our findings are consistent with those studies.

2. There are several notable exceptions. Short (1968) and Elliott and Voss (1974) relied on official reports to measure friends' behaviors, Reiss and Rhodes (1964) obtained friends' reports of their own behavior, and Cairns and Cairns (1994) studied teacher ratings and sociometric nominations.

3. This tendency is evident in the numerous studies of deviance that compare respondents' reports about peers with the peers' own responses (for delinquency: Elliott and Voss 1974; Gold and Osgood 1992; Huizinga et al. 1992 [cited by Kandel 1996]; for substance use: Bauman and Fisher 1986; Kandel 1974; and for sexual behavior: Wilcox and Udry 1986).

4. A good case could be made that what adolescents think their friends do is more influential than what the friends actually do (e.g., Mead 1934). Yet this is not sufficient justification for the lack of an independent measure of friends' delinquency. Jussim and Osgood (1989) show that the respondents' report about peers and an independent measure about them are necessary to separate such subjective influence from assumed similarity.

5. Additionally, we can expect that those friends who could not be nominated due to this restriction will be less important (or less close) to the respondent than those who were nominated (Moody 1999).

6. Additionally, we separated the overall delinquency index into violence and property indices. Analyses using these two dependent variables produced no meaningful differences, so they will not be reported below.

7. All analyses were also examined using a measure of the peer network incorporating only those nominations made by the respondent. Preliminary analyses indicated findings similar to those presented below using the more inclusive measure of the friendship network.

8. Dividing by the square root of the number of friends is a compromise between the sum across friends and the average across friends. The former is unduly correlated with the number of friends (r = .60), while the latter makes the unreasonable assumption that respondents with many friends spend no more time socializing than those with few friends. Because of the role that number of friends plays in this measure, we also control for number of friends in our analyses.

9. To reduce collinearity, we subtracted the mean of age before forming the squared term.

10. We elected not to use parents' report of income to measure social class due to the large amount of missing data on this indicator.

11. Of course, the ideal data design would incorporate longitudinal measures of friendship networks that allow for analyses of changes in network composition over time.

12. As recommended by Long (1997), we standardized our tobit coefficients based on the standard deviation of the latent dependent variable. We estimated that standard deviation from the residual variance of a null tobit model with no explanatory variables.

13. Each of the peer measures was mean-centered before being multiplied together to create the interaction terms introduced into the analyses. This reduces multicollinearity and allows the "main effect" terms to retain their meaning as the overall or average effect of the variable.

References

Ackerman, Jeffrey M. 2003. "Delinquents and Their Friends: The Role of Peer Effects and Self-Selection." Ph.D. Dissertation, Crime, Law and Justice Program, Department of Sociology, Pennsylvania State University.

Agnew, Robert. 1991. "The Interactive Effect of Peer Variables on Delinquency." *Criminology* 29:47-72.

Agnew, Robert, and David M. Peterson. 1989. "Leisure and Delinquency." *Social Problems* 36:332-350.

Akers, Ronald L. 1985. *Deviant Behavior: A Social Learning Approach*. Wadsworth.

Akers, Ronald L., Marvin D. Krohn, Lonn Lanza-Kaduce and Marcia Radosevich. 1979. "Social Learning and Deviant Behavior: A Specific Test of a General Theory." *American Sociological Review* 44:636-655.

Aseltine Jr., Robert. 1995. "A Reconsideration of Parental and Peer Influences on Adolescent Deviance." *Journal of Health and Social Behavior* 36:103-121.

Bauman, Karl E., and Susan T. Ennett. 1994. "Peer Influence on Adolescent Drug Use." *American Psychologist* 49: 820-822.

Bauman, Karl E., and L.A. Fisher. 1986. "On the Measurement of Friend Behavior in Research on Friend Influence and Selection: Findings from Longitudinal Studies of Adolescent Smoking and Drinking." *Journal of Youth and Adolescence* 15: 413-422.

Bearman, Peter S., Jo Jones and J. Richard Udry. 1997. "The National Longitudinal Study of Adolescent Health: Research Design." URL:http://www.cpc.unc.edu/projects/addhealth/design.html.

Blau, Peter M. 1977. *Inequality and Heterogeneity*. Free Press.

Blythe, D.A., J.P. Hill and K.S. Thiel. 1982. "Early Adolescent's Significant Others: Grade and Gender Differences in Perceived Relationships with Familial and Nonfamilial Adults." *Journal of Youth and Adolescence* 11:425-445.

Briar, Scott, and Irving Piliavin. 1965. "Delinquency, Situational Inducements, and Commitment to Conformity." *Social Problems* 13:35-45.

Brown, Bradford B. 1990. "Peer Groups and Peer Cultures." In *At the Threshold: The Developing Adolescent*. S.S. Feldman and G.R. Elliott, editors. Harvard University Press.

Byrne, Donn, and Barbara Blaylock. 1963. "Similarity and Assumed Similarity of Attitudes Between Husbands and Wives." *Journal of Abnormal and Social Psychology* 67:636-640.

Cairns, Robert B., and Beverly D. Cairns. 1994. *Lifelines and Risk: Pathways of Youth in Our Time*. Cambridge University Press.

Cloward, Richard A., and Lloyd E. Ohlin. 1960. *Delinquency and Opportunity: A Theory of Delinquent Gangs*. Free Press.

Cohen, Albert. 1955. *Delinquent Boys*. Free Press.

Cohen, Lawrence E., and Marcus Felson. 1979. "Social Change and Crime Rate Trends: A Routine Activity Approach." *American Sociological Review* 44:588-608.

Coleman, J.R. 1961. *The Adolescent Society: The Social Life of the Teenager and Its Impact on Education*. The Free Press of America.

Dishion, Thomas J., Kathleen M. Spracklen, David W. Andrews and Gerald R. Patterson. "Deviancy training in male adolescents friendships." *Behavior Therapy* 27:373-390.

Durkheim, Emile. 1951. *Suicide*. Free Press.

Elliott, Delbert S., Suzanne S. Ageton and Rachelle J. Canter. 1979. "An Integrated Perspective on Delinquent Behavior." *Journal of Research on Crime and Delinquency* 16:3-27.

Elliott, Delbert S., David Huizinga and Suzanne S. Ageton. 1985. *Explaining Delinquency and Drug Use*. Sage.

Elliott, Delbert S., and Scott Menard. 1996. "Delinquent Friends and Delinquent Behavior: Temporal and Developmental Patterns." *Delinquency and Crime: Current Theories*. J. David Hawkins, editor. Cambridge University Press.

Elliott, Delbert S., and Harwin L. Voss. 1974. *Delinquency and Dropout*. Lexington Books.

Erickson, Maynard L., and Lamar T. Empey. 1965. "Class Position, Peers and Delinquency." *Sociology and Social Research* 49:268-282.

Erickson, Maynard L., and Gary F. Jensen. 1977. "Delinquency is Still Group Behavior!: Toward Revitalizing the Group Premise in the Sociology of Deviance." *Journal of Criminal Law and Criminology* 68:262-273.

Felson, Marcus. 2002. *Crime and Everyday Life*. 3rd edition. Sage.

Gardner, William, Edward P. Mulvey and Esther C. Shaw. 1995. "Regression Analyses of Counts and Rates: Poisson, Overdispersed Poisson, and Negative Binomial." *Psychological Bulletin* 118:392-405.

Giordano, Peggy C., Stephen A. Cernkovich and M.D. Pugh.1986. "Friendships and delinquency." *American Journal of Sociology* 91:1170-1202.

Glueck, Sheldon, and Eleanor Glueck. 1950. *Unraveling Juvenile Delinquency*. Harvard University Press.

Gold, Martin. 1970. *Delinquent Behavior in an American City*. Brooks/Cole.

Gold, Martin, and D. Wayne Osgood. 1992. *Personality and Peer Influence in Juvenile Corrections*. Greenwood Press.

Gottfredson, Michael R., and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford University Press.

Hawley, Amos. 1950. *Human Ecology: A Theory of Community Structure*. Ronald.

Haynie, Dana L. 2001. "Delinquent Peers Revisited: Does Network Structure Matter?" *American Journal of Sociology* 106:1013-1057.

_____. 2002. "Friendship Networks and Delinquency: The Relative Nature of Peer Delinquency." *Journal of Quantitative Criminology* 18:99-134.

Hindelang, Michael J. 1976. "With a Little Help from Their Friends: Group Participation in Reported Delinquent Behavior." *British Journal of Criminology* 16:109-125.

_____. 1973. "Causes of Delinquency: A Partial Replication and Extension." *Social Problems* 20:471-487.

Hindelang, Michael J., Travis Hirschi and Joseph G. Weis. 1979. "Correlates of Delinquency: The Illusion of Discrepancy Between Self-Report and Official Measures." *American Sociological Review* 44:995-1014.

Hirschi, Travis. 1969. *Causes of Delinquency*. University of California Press.

Hobbes, Thomas. 1957. *Leviathon*. Basil Blackwell.

Huizinga, David, Ann Weier and Finn-Aage Esbense. 1992. "Intergenerational Transmission of Delinquency and Drug Use." Paper presented at the Meetings of the Society of Research on Adolescence, March. Washington, DC.

Johnson, N.L., and S. Kotz. 1970. *Continuous Univariate Distributions-1*. Houghton Mifflin.

Jussim, Lee, and D. Wayne Osgood. 1989. "Influence and Similarity among Friends: An Integrative Model Applied to Incarcerated Adolescents." *Social Psychology Quarterly* 52:98-112.

Kandel, Denise B. 1974. Interperson Influences on Adolescent Illegal Drug Use. *The Epidemiology of Drug Abuse*, E. Josephson and E. Carroll, editors. Winston.

_____. 1996. "The Parental and Peer Contexts of Adolescent Deviance: An Algebra of Interpersonal Influences." *Journal of Drug Issues* 26:289-315.

Krohn, Marvin D., Alan J. Lizotte, Terence P. Thornberry, Carolyn Smith and David McDowall. 1996. "Reciprocal Causal Relationships among Drug Use, Peers, and Beliefs: A Five-Wave Panel Model." *Journal of Drug Issues* 26:405-428.

Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Sage.

Matsueda, Ross L. 1982. "Testing Control Theory and Differential Association: A Causal Modeling Approach." *American Sociological Review* 47 489-504.

Matsueda, Ross L., and Kathleen Anderson. 1998. "The Dynamics of Delinquent Peers and Delinquent Behavior." *Criminology* 36:269-308.

Matza, David, and Gresham M. Sykes. 1961. "Juvenile Delinquency and Subterranean Values." *American Sociological Review* 26:712-719.

McCullagh, P., and J.A. Nelder. 1989. *Generalized Linear Models*. 2d edition. Chapman and Hall.

McPherson, J. Miller, and Lynn Smith-Lovin. 1987. "Homophily in Voluntary Organizations: Status Distance and the Composition of Face-to-Face Groups." *American Sociological Review* 52:370-379.

Mead, George H. 1934. *Mind, Self and Society*. University of Chicago Press.

Moody, James. 1999. "The Structure of Adolescent Social Relations: Modeling Friendship in Dynamic Social Settings." Ph.D. Dissertation, Department of Sociology, University of North Carolina, Chapel Hill, NC.

Newcomb, Theodore M. 1950. *Social Psychology*. Dryden.

_____. 1961. *The Acquaintance Process*. Holt, Rinehart and Winston.

Osgood, D. Wayne, Laura L. Finken and Barbara J. McMorris. 2002a. "Analyzing Multiple-item Measures of Crime and Deviance II: Tobit Regression." *Journal of Quantitative Criminology* 18: 319-347.

Osgood, D. Wayne, Barbara J. McMorris and Maria T. Potenza. 2002b. "Analyzing Multiple-item Measures of Crime and Deviance I: Item Response Theory Scaling." *Journal of Quantitative Criminology* 18: 267-296.

Osgood, D. Wayne, and David C. Rowe. 1994. "Bridging Criminal Careers, Theory, and Policy Through Latent Variable Models of Individual Offending." *Criminology* 32:517-554.

Osgood, D. Wayne, Janet K. Wilson, Patrick M. O'Malley, Jerald G. Bachman and Lloyd D. Johnston. 1996. "Routine Activities and Individual Deviant Behavior." *American Sociological Review* 61:635-55.

Reiss, Albert J., Jr., and A. Lewis Rhodes. 1964. "An Empirical Test of Differential Association Theory." *Journal of Research in Crime and Delinquency* 1:5-18.

Riley, David. 1987. "Time and Crime: The Link Between Teenager Lifestyle and Delinquency." *Journal of Quantitative Criminology* 3:339-354.

Samejima, Fumiko. 1969. "Estimation of Latent Ability Using a Response Pattern of Graded Scores." *Psychometrika Monograph Supplement*. No.17.

Shaw, Clifford R., and Henry D. McKay. 1942. *Juvenile Delinquency and Urban Areas*. University of Chicago Press.

Short, James F. Jr. 1968. *Gang Delinquency and Delinquent Subcultures*. Harper & Row.

_____. 1957. "Differential Association and Delinquency." *Social Problems*, 4:233-239.

Simmel, Georg. 1955. *The Web of Group Affiliations*. Free Press.

Stata Corp. 1997. *Stata Statistical Software: Release 5.0*. Stata Corporation.

Sutherland, Edwin H., and Cressey, Donald R. 1955. Principles of Criminology. 5th edition. J.B. Lippincott.

Tannenbaum, Frank. 1938. C*rime and the Community*. Columbia University Press.

Thornberry, Terence P. 1987. "Toward an Interactional Theory of Delinquency." *Criminology* 25:863-891.

Thrasher, Frederick. 1927. *The Gang: A Study of 1,313 Gangs in Chicago*. University of Chicago Press.

Warr, Mark. 1993a. "Age, Peers, and Delinquency." *Criminology* 31:17-40.

_____. 1993b. "Parents, Peers, and Delinquency." *Social Forces* 72:247-264.

_____. 1996. "Organization and Instigation in Delinquent Groups." *Criminology* 34:11-38.

_____. 2002. *Companions in Crime*. Cambridge University Press.

Wilcox, Steven, and J. Richard Udry. 1986. "Autism and Accuracy in Adolescent Perceptions of Friends' Sexual Attitudes and Behaviors." *Journal of Applied Social Psychology* 16:361-374.